

## Diamond Magnesium/Painesville

Painesville, Ohio

The Diamond Magnesium/Painesville FUSRAP site was formerly a magnesium production facility. In 1951, 1952 and 1953, the Diamond Magnesium Company received 1,650 tons of radiological contaminated scrap steel from the Lake Ontario Ordnance Works to be used to control chlorine emissions during magnesium production. In the 1960s the General Services Administration sold the Diamond Magnesium facility to Uniroyal Chemical Company and LONZA, Inc.

### **SITE DESCRIPTION**

Located at 720 Fairport Nursery Road in Painesville, Ohio, approximately 22 miles northeast of Cleveland, the site is currently owned by the Chemtura Corporation. The Grand River is located 0.1 mile southwest of Fairport Nursery Road and flows northwest toward Lake Erie. All production has ceased and all buildings but one have been razed.

In the early 1940s, Defense Plant Corporation financed construction of a magnesium production facility in Painesville, Ohio, on property acquired by the federal government. In support of World War II and later government operations, Diamond Magnesium operated the facility from 1942 to 1953 for the General Services Administration (GSA). In 1963, the GSA sold the plant to the U.S. Rubber Company, which later became the Uniroyal Chemical Company, then the Crompton Manufacturing Company, Inc., and is now Chemtura. Uniroyal produced nitrile rubber, polyvinyl chloride (PVC) nitrile rubber, and various polymers until it ceased operations in 1999. Uniroyal used several of the original Diamond Magnesium buildings for operations and also built new ones. Uniroyal constructed several landfills, impoundments and lagoons on adjacent properties for waste disposal. Chemtura is addressing the investigation and cleanup activities for chemical contamination at the site while the U.S. Army Corps of Engineers (USACE) is addressing the radiological cleanup.

There is no known history of processing or production of radioactive materials at the Painesville site. The radioactivity found on site resulted from the use of scrap ferrous metal to scrub chlorine gas that was released during magnesium production. The GSA sought such scrap metal from the U.S. Atomic Energy Commission (AEC) inventories at the Lake Ontario Ordnance Works (LOOW) in Niagara Falls, New York. By the early 1950s, LOOW had accumulated significant quantities of scrap metal, in part because metal drums were used to ship and store residues from the processing of pitchblende ores. When the pitchblende residues were consolidated into a storage facility at LOOW, the emptied drums were cleaned for reuse or scrapped. These drums, which contained observable residues of pitchblende ores, were part of the scrap shipped to the Painesville site (ORNL, 1991). The contamination went undisclosed by the Federal Government prior to use at the facility. The radionuclides contained within the

pitchblende residues (primarily radium, thorium, and uranium and their naturally occurring decay products) are considered FUSRAP related.

Approximately 1,650 tons of scrap metal was shipped to the site between July 1952 and April 1953. The scrap metal was delivered by railroad to the western side of the property where it was stored on the ground with no cover. Former employees indicated an additional delivery route was also present on the eastern side of the property, where scrap was moved from the west railroad siding to the east siding by pulling uncovered rail-sided wooden skids or sleds with a tractor (Eddington, 1996). In a recent interview, a former plant manager indicated that scrap was off-loaded from both east and west spurs and was moved via railcar from one siding to another (Trumbel, 2001). From the eastern side, the scrap metal was either immediately added to the hydrochloric acid (HCl) digester tanks or stored on the ground (ORNL, 1990).

The scrap metal used to scrub chlorine gas was immersed in weak HCl for complete digestion. Liquid acid waste from the process was discharged directly into the Grand River until June 1952, at which time the discharge was redirected across the Grand River into a waste pond owned by the Diamond Alkali Company.

Because the radioactive contaminants in the scrap metal were related to AEC activities, Oak Ridge National Laboratory (ORNL) conducted a preliminary and limited radiological survey in 1988. The findings indicated that residual radioactivity was present above existing guidelines for unrestricted use (ORNL, 1990; 1991). The principal radioactive contaminants were determined to be U-238, Ra-226, Th-230, and their naturally occurring decay products. Based on these initial surveys, Department of Energy (DOE) designated it a FUSRAP site for further evaluation and remedial action (DOE, 1992). The authorization for remedial action only includes FUSRAP related constituents.

## **SITE INVESTIGATIONS**

In October 1988, ORNL performed a preliminary site evaluation. ORNL performed a walkover survey and collected soil samples for radiological analysis. During the survey, information was obtained concerning other portions of the property, which would need to be addressed as part of future efforts (ORNL, 1990). ORNL returned in September 1990, to examine the property to the east (owned by Twin Rivers Technologies), adjacent to the railroad tracks, and to investigate areas that showed elevated gamma readings found during the 1988 survey. The survey results (ORNL, 1991) indicated that elevated concentrations of radionuclides were found in both surface and subsurface soil in excess of DOE guidelines. The primary contaminants were U-238, Th-230, and Ra-226, with radioactivity levels up to 76 pCi/g, 310 pCi/g and 1,500 pCi/g, respectively.

In 1996, Bechtel National Inc., Science Applications International Corporation, and Argonne National Lab, under contract to DOE, performed a detailed investigation. This investigation included, external gamma rate exposure measurements, building radiological surveys, surface geophysical surveys, walkover surveys, ambient air, ground water, surface water, sediment, ecological, and soil sampling. The results are documented in the Characterization Report for the Painesville Site (USACE, 1998a).

In 1998, USACE completed an Engineering Evaluation/Cost Analysis (EE/CA) to support a removal action. The EE/CA developed cleanup goals and evaluated alternatives for addressing the radiological contamination. The selected alternative was documented in an Action Memorandum and the removal action was started in the fall of 1998. Slightly more than 1,300 cubic yards were removed before the project was suspended due to a combination of bad weather and greater than anticipated extent of contamination. Subsequent sampling indicated that radiological contamination above the cleanup goals still existed (USACE, 1999).

In May 2003, USACE completed a Remedial Investigation/Feasibility Study (RI/FS) of the Painesville Site (USACE, 2003). During the RI/FS, additional data was collected, a Baseline Risk Assessment was conducted, and alternatives were developed and evaluated. These alternatives included capping the contamination in place, excavation, and off-site disposal. In June 2005, USACE completed a Feasibility Study Addendum which amended the cleanup goals and alternatives first presented in the RI/FS.

A Record of Decision was signed in 2006 to remediate soils contaminated with residual radioactivity from past activities. The cleanup began in April 2007. Approximately 9,400 cubic yards of contaminated soil have been excavated. Nine of the twelve areas have been successfully excavated and backfilled. Again work was stopped due to finding additional contamination that was not identified or accounted for in the cleanup costs. The USACE estimates that an additional 15,000 cubic yards of soil still needs to be removed. Cleanup is expected to resume in 2010.

Related Link: [www.lrb.usace.army.mil/fusrap/](http://www.lrb.usace.army.mil/fusrap/)

### **Information Sources**

Document repositories for the Diamond Magnesium site are located:  
Fairport Harbor Public Library  
335 Vine Street  
Fairport Harbor, Ohio

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For environmental questions relating to this site contact:

[Kurt Kollar](#)  
Ohio EPA  
330-963-1160

OR:

Ohio Department of Health  
Bureau of Radiation Protection  
614-644-2727